Research Article

A Study to Evaluate the Effectiveness of a Structured Teaching Program on Knowledge of Nursing Care of Pacemaker Implantation Patients among IV Year B. Sc., Nursing Students in Selected Colleges in Mysore

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Abstract

Aim: The study aimed to evaluate the effectiveness of a structured teaching program on knowledge of nursing care of pacemaker implantation patients among IV year B.Sc., nursing students in selected colleges in Mysore.

Material and Methods: Evaluator research approach was selected for this study. The experimental one group pre-test, post-test design used. The study was conducted in two nursing colleges at Mysore, population in the study was IV year B.Sc., nursing students. The sample of the study was 60 IV year B. Sc., nursing Students. A simple random sampling technique was used to select the samples for the study.

Result: The study's findings indicate that the implementation of the structured teaching program, the average overall knowledge of IV year Basic B.Sc., and nursing students regarding nursing care of pacemaker implantation patients was 42.96%, with a mean of 10.74 and a standard deviation of 3.24. Consequently, it was observed that 70% of the students possessed inadequate knowledge, while 30% had moderately adequate knowledge. None of the students demonstrated adequate knowledge in this area. Following the implementation of the structured teaching program, the students' knowledge on nursing care of pacemaker implantation patients increased by 42.96%. The analysis yields a net benefit of 42.96% in terms of knowledge acquisition.

Conclusion: The study's findings indicate a notable disparity in pre-test and post-test knowledge scores regarding the care of patients among 4th-year B.Sc., nursing students. It can be stated that the implementation of structured teaching program on the subject of nursing care for patients with pacemaker implants was successful in enhancing knowledge.

Keywords: B.Sc., nursing students, effectiveness, knowledge pacemaker implantation, structured teaching program

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Introduction

Heart illnesses are a significant burden on society and a source of concern for everyone from patients to medical professionals and policymakers. Another reason for concern is heart disease, which can ultimately result in heart failure. In point of fact, arrhythmias are responsible for around sixty percent of all cardiac deaths, which result in sudden cardiac arrest.

Researchers consider the practice of reusing pacemakers to be a risk-free alternative in situations like these. A recent study that was conducted in the United States and published in the American Journal of Cardiology found that implanting permanently donated pacemakers can not only save lives but also improve the quality of life of people who are in need and have a low income. According to the scientists, recycling pacemakers has the potential to "relieve the burden of symptomatic bradyarrhythmia (abnormally slow heart rate) in impoverished nations around the world.[1]

Contraction of the heart muscle is triggered by electrical impulses that are generated and swiftly conducted by the heart's specialized system. When everything is working as it should, the atrium contracts around 1/60th of a second before the ventricles do. To ensure sufficient cardiac output for perfusion of all body organs and tissues, this ordered electrical activity must precede contraction. The senatorial node (also known as the sinus node or SA node) is the origin of the electrical impulse that causes the heart to contract. After leaving the SA node, the signal visits the atriums. After that, the signal goes through what's called the AV node. The next step is a trip via the ventricles, the bottom chambers of the heart. The speed at which the heart beats is controlled by various nerve impulses.[2]

In all aspects of identification, prevention, control, and rehabilitation, nurses play an essential part. They frequently serve in the capacity of case manager, collaborating closely with patients and their families while being based in general or family practices, hospitals, or community settings. Their function might be improved by making use of the most recent technological advances, participating in administrative and support training, and exchanging ideas, experiences, and findings with one another. Building up one's capacity and capabilities is just as important as presenting evidence that something is effective, safe, and of high quality. Last but not least, the nursing profession has a responsibility to ensure that it is represented and has a seat at the policymaking table.[3]

As the prevalence of cardiovascular disease increases with age, a growing number of patients defibrillate (ICDs). Over the past decade, pacemaker implantation procedures have increased by 55%, according to one study. As an increasing number of patients are implanted with pacemakers and implantable cardioverter defibrillators (ICDs), it is imperative that the emergency department (ED) be prepared for medical emergencies that may bring these individuals in. This article will review the most important diagnostic and therapeutic considerations in the emergency care of patients with pacemakers and ICDs.[4]

Permanent cardiac pacemakers are implantable devices that maintain a suitable heartbeat when natural mechanisms fail due to heart conduction system or pacemaker deficiencies. With an ageing population, nurses in all jobs would need to care for pacemaker patients, and evidence-based care and expertise were essential.[5]

Objectives

The objectives of the study are as follows:

- To assess the pre-test level of knowledge regarding the nursing care of pacemaker patients among IV year B.Sc., nursing students in selected colleges at Mysore.
- To assess the post-test level of knowledge regarding the nursing care of pacemaker patients among IV year B.Sc., nursing students in selected colleges at Mysore.
- To determine the effectiveness of STP on knowledge regarding the nursing care of pacemaker patients among IV year B.Sc., nursing students in selected colleges at Mysore.
- To find out the association between knowledge regarding the nursing care of pacemaker patients among IV year B.Sc. nursing students with selected demographic variables hypotheses:
  1. H1: There will be a significant difference between pre-test and post-test level knowledge scores on nursing care of pacemaker implantation patients among IV year B.Sc., nursing students.
  2. H2: There will be a significant association between pre-test knowledge scores with selected demographical variables.

MATERIALS AND METHODS

Research approach

Research approach selected for this study is the evaluatory approach.

The experimental one group pre-test and post-test design as a research design was used for assessing the knowledge level of IV year B.sc nursing students regarding nursing care of pacemaker implantation patients.

Variables

Independent variable

Structured teaching program on nursing care of implantation of pacemaker patients.

Dependent variable

Dependent variable year B.Sc., nursing student's knowledge regarding nursing care of pacemaker implantation patients.

Setting of the study

The study was conducted in two nursing colleges at Mysore, Vikram College of Nursing and St. Joseph College of Nursing that were selected for the study.

Population

Population included in the present study was IV year B.Sc., nursing students.

Sample and sampling techniques

The sample of the study comprised 60 IV year B.Sc. nursing students.

A simple random sampling technique was used to select the samples for the study.

Criteria for the sample collection
Inclusive criteria
The following criteria were included in the study:

IV year B.Sc., nursing students who were present in selected colleges during data collection.

Both male and female students IV year students.

Students those were willing to participate in study.

Exclusive criteria
The following criteria were excluded from the study:

Student who were physically ill.

Students who were in long leave.

RESULTS

Section-A – Socio demographic data.

Section-B – Structured knowledge questionnaire schedule regarding nursing care of pacemaker implantation patients.

Table 1 shows the 80% of IV year B.Sc., nursing students were in the age group of 20–21 years, 10% of students were age of 22–23 years,10% of students were age 24–25 and none of them were above 26 years, 20% of the IV year B.Sc., nursing students were male and 80% were found female, 45% of the IV year Basic B.sc nursing student had 50–55% of marks in II year, 35% of students had 55–60% of marks, 15% of students had 60–65% and 5% of students had above 60% in II year B.Sc., 56% of IV year basic B.Sc., male nursing students received previous information regarding nursing care of pacemaker implantation patients through clinical posting, 24% of students received knowledge through lab demonstration, and 20% of students received knowledge from family.

Table 2 shows, in pre-test (42) 70% of the students are having inadequate knowledge and (18) 30% of them having moderately adequate knowledge and none of them having

Table 1: Frequency and percentage distribution of demographic variables (*N*=60)

Variable	N	%
Age		
20–21 years	50	80
22–23 years	5	10
24–25 years	5	10
26 above	0	0
Gender		
Male	12	20
Female	48	80
Percentage of marks in II-year B.Sc., nursing		
50–55%	27	45
55–60%	21	35
60–65%	9	15
65 and above	3	5
Exposure to previous practical knowledge on the care of pacemaker patients		
Family Laboratory	12	20
Demonstration	14	24
Clinical posting	34	56

adequate knowledge. To determine the overall pre-test knowledge of the subjects.

Table 3 shows, on an average students are having only 42.96% of knowledge before having structured teaching program on nursing care of pacemaker patients.

Table 4 shows, in post-test, 82% of the students are having adequate knowledge and 18% of them having moderately adequate knowledge and none of them having inadequate knowledge regarding nursing care of pacemaker implantation patients among IV year B.Sc., nursing students at selected colleges Mysore.

Table 5 shows, on an average students are having 85.92% of knowledge after having structured teaching program on nursing care on pacemaker implantation patients.

Table 6 shows improvement of knowledge score of IV year Basic B.Sc., nursing after having structured teaching program. On nursing care of pacemaker implantation patients, the difference between pre- and post-test knowledge score is large

Table 2: Pre-test level of knowledge regarding pacemaker implantation patients (*N*=60)

Level of knowledge	No. of students	%
Inadequate knowledge	42	70.0
Moderately adequate knowledge	18	30.0
Adequate knowledge	0	0.0
Total	60	100

Table 3: Mean percentage and standard deviation of pre-test knowledge score regarding nursing care of pacemaker implantation patients (*N*=60)

Knowledge variable	No. of questions	Min-Max score	Mean±SD	Percentage of knowledge
Overall pre-test knowledge	30	1–30	10.74±3.24	42.96

Table 4: Post-test knowledge of IV year B.Sc., nursing students regarding pacemaker implantation patients in selected colleges at Mysore (N=60)

Level of knowledge regarding nursing care of pacemaker implantation patients	No. of students (N)	%
Inadequate knowledge	0	0.0
Moderately adequate knowledge	11	18.0
Adequate knowledge	49	82.0
Total	60	100

Table 5: Post-test knowledge score on strecture teaching program on nursing care of pacemaker implantation patients (N=60)

% of students	No. of questions	Min–Max score	Mean±SD	Percentage of knowledge
Overall post-test knowledge	30	1–30	21.48±2.75	85.92%

and it is significant. Statistical significance was calculated using Student's paired t-test.

Table 7 shows the net benefit of STP, in knowledge regarding nursing care of pacemaker implantation patients, IV year basic B.Sc., and nursing students gained 42.96% more knowledge on nursing care of pacemaker implantation patients after the administration of structured teaching program. About 42.96% of knowledge is the net benefit of this study.

Table 8 shows association between IV year Basic B. Sc nursing student's sociodemographic variables and their level of knowledge score.

Percentage of II year marks and previous knowledge are closely associated with their post-test knowledge. Students gained more knowledge and other variables are not associated. Statistical significance difference was calculated using Pearson Chi-square test/Yates corrected Chi-square test.

DISCUSSION

The results matched another study. This cross-sectional descriptive study was conducted on Kerman University-affiliated hospital nurses in 2007. After validating and reliable, a researcher-made questionnaire with 36 nursing care questions (15 hospital care and 21 discharge time nursing care) was used to collect data. SPSS 15 used descriptive statistics indices, Chi square, Pearson, and mean comparison tests. The average post-operative care score was 23.30±6.27. The discharge time mean score was 44.66±14.30. Pearson test showed that post-operative and discharge time care scores are related ($r=0.577; P=0.0001$). There was no correlation between cardiac re-education courses and post-operative and discharge time care scores. Given nurses' lack of patient education knowledge and the critical circumstances of these patients, nursing re-education and functional content courses are proposed.[6]

Weill Medical College of Cornell University conducted a retrospective study in June 2007 to determine the frequency of symptoms that result in the implantation of permanent pacemakers. Additional study information was provided by Weill Medical College of Cornell University in June 2007 on 500 enrollments. This study aims to identify the determinants for permanent pacemaker implantation soon after heart surgery. The following will be evaluated to see if they can, if at all, be used to forecast the need for permanent pacemaker installation. It is likely that by looking into the comorbidities, diagnoses, or histories connected to an endpoint permanent pacemaker placement, we will be able to better predict who will need to have a permanent pacemaker placed.[7]

A pre-experimental, one group, pre-test, and post-test only design was adopted. Purposive non-probability sampling was used for the sampling process. The Multispecialty Government Hospital in New Delhi was the site of the study. There were 80 staff nurses in the sample. The palliative care quiz for nurses was adapted and utilized as the tool for producing the necessary data. The pre-test, which included a knowledge quiz and a planned training program, was given on the 1st day. A knowledge post-test was given on the 7th day to gauge how well the structured instruction program had worked. Utilizing both descriptive and inferential statistics, the data were examined. The results showed that staff nurses had a knowledge gap, with a mean pre-test score of 10.712 and a standard deviation of 5.0845. With a post-test mean score of 28.712 and a standard deviation of 1.313, there was a considerable improvement in knowledge following a structured instruction program. The study's conclusions showed that a systematic teaching program was successful in raising staff nurses' knowledge of palliative care.[8]

The calculated unpaired t value of 12,002 for the comparison of post-test knowledge between the experimental and control groups was statistically significant at the $P = 0.001$ level. Regarding the comparison of post-test skill level, the calculated unpaired t value of 9.577 indicated a statistically significant difference at the $P = 0.001$ level. The analysis of the correlation coefficient between knowledge and competence using the Karl Pearson correlation yielded an r-value of 0.375, indicating a positive correlation at $P = 0.05$ in the experimental group. No statistically significant association was found between demographic variables and the experimental group's mean differed knowledge and post-test scores. The study concluded

Table 6: Comparison of pre-test and post-test overall knowledge score

Variable	No. of students	Mean±SD		Student paired t-test
		Pre-test	Post-test	
Overall knowledge score	60	10.74±3.24	21.48±2.75	t=19.98 P=0.001 Significant

Table 7: Effectiveness of structured teaching program

Variable	% of pretest	% of posttest	% of gain
Knowledge	42.96	85.92	42.96

Table 8: Association between level of knowledge and student's demographic variables (N=60)

Demographic variable	n	%	Pearson Chi-square test
Age			
20–21 years	50	80	2=0.54, P=0.46
22–23 years	5	10	Not significant
24–25 years	5	10	
26 above	0	0	
Gender			
Male	12	20	2=2.26, P=0.32
Female	48	80	Not significant
Percentage of marks in II-year B.sc Nursing			
50–55%	27	45	2=7.58, P=0.02
55–60%	21	35	Significant
60–65%	9	15	
65 and above	3	5	
Exposure to Previous practical knowledge on the care of pacemaker patients			
Family laboratory	12	20	2=7.20, P=0.01
Demonstration	14	24	Significant
Clinical posting	34	56	

that the investigator's pacemaker care protocol was an effective tool for enhancing nurses' knowledge and skills regarding the treatment of patients undergoing pacemaker implantation Beny NR.[9]

The purpose of this study was to see how well an instructional program for nurses managing patients with permanent pacemakers worked. More than two-thirds of nurses had bad total knowledge before program implementation, more than two-thirds had good total knowledge post-program implementation, and more than half had good total knowledge on follow-up after program implementation. The majority of the nurses investigated had an unsatisfactory level of practice before the program, nearly two-thirds had a satisfactory level of practice after the program, and more than half had a satisfactory total practice follow-up program implementation. When compared to their baseline assessment, nurses' knowledge and practice improved statistically significantly both immediately and after 2 months.[10]

CONCLUSION

The result of the study concluded that there is a significant difference between pre-test and post-test level knowledge scores on care of patients among IV year B.Sc., and nursing students so the structured teaching program on knowledge of nursing care of pacemaker implantation patients was effective.

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CONFLICTS OF INTEREST

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REFERENCES

1. Reused-pacemakers-socially-correct-ethically-wrong. Available from: https://www.expresshealthcare.in/sections/knowledge/823 [Last accessed on 2023 May 07].
2. Black JM, Hawks JH. Medical Surgical Nursing Clinical Management for Positive Outcome. 8th ed., Vol. 2. Saint Louise: Elsevier; 2009. p. 1450.
3. Narayani S, Manju J. Protocol on pre and post-operative nursing management of cardiac surgery. Indian J Nurs Stud 2011;2:51-6.
4. McMullan J, Valento M, Attari M, Venkat A. Care of the pacemaker/implantable cardioverter defibrillator patient in the ED. Am J Emerg Med 2007;25:812-22.
5. Permanent Cardiac Pacing. Available from: https://nursingstandard.rcnpublishing.co.uk/archive/article-an-overview-of-permanent-cardiac-pacing [Last accessed on 2023 Jun 24].
6. Sohail MR, Uslan DZ, Khan AH, Friedman PA, Hayes DL, Wilson WR, et al. Risk factor analysis of permanent pacemaker infection. Clin Infect Dis 2007;45:166-73.
7. Placement of Permanent Pacemaker Study. Available from: https://clinicaltrials.gov/ct2/show/NCT00512161 [Last accessed on 2023 Jul 15].
8. Dagar P, Rani S, John N. A study to evaluate the effectiveness of structured teaching programme on palliative care in terms of knowledge among staff nurses in selected hospital of New Delhi. Int J Nurs Midwifery Res 2020;7:8-12.
9. Effectiveness of Pacemaker Care Protocol on Knowledge and Skill Regarding Care of Client Undergoing Pacemaker Implantation among Nurses at Selected Hospitals, Nagercoil. Doctoral Dissertation. Chennai: Omayal Achi College of Nursing; 2015.
10. Elsebai HA, Ragheb MM, Ghonaem SE. Effectiveness of an educational program for management of patients undergoing permanent pacemaker on nurses' performance. J Nurs Sci Benha Univ 2022;3:273-87.